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A Secure Address Allocation Scheme for Wireless Area Distributed Communication Network

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Abstract.
As deployed Grids increase from tens to thousands of nodes, Peer-to-Peer techniques and protocols can be used to implement scalable services and applications. The Address allocation model is a novel approach that helps the convergence of wireless network and Grid environments and can be used to deploy information service in Grids. A Deterministic peer serves a single Virtual Organization (VO) in a Grid, and manages metadata associated to the resources provided by the nodes of that VO. In our proposed research work we need to connect each other to form a peer network at a higher level. This paper examines how the proposed architecture can be used to handle membership management and resource discovery services in a multi-organizational Grid. A simulation analysis evaluates the performance of a resource discovery protocol; simulation results can be used to tune protocol parameters in order to increase search efficiency. As we know that data transmission by the electronic signals are growing very highly so the fault tolerance are making so difficult by performing the proposed address resolution scheme we can get the desired result in wireless area network

Keyword: WLAN, Virtual Organizations, Peer to Peer Network, Grid Architecture.

I Introduction

Nodes computing and peer-to-peer computing models share several features and have more in common than we generally recognize. As Grids used for complex applications increase from tens to thousands of nodes, their functionalities should be decentralized to avoid bottlenecks. The Proposed architecture could favor Grid scalability: designers can use Grid style and techniques to implement decentralized Grid systems.

The adoption of the service oriented model in novel Grid systems (for example the Open Grid Services Architecture (OGSA [1]), or the Web Services Resource Framework (WSRF) [12]) will support the convergence between the two models, since Web Services can be used to implement Peer internetwork interactions between hosts belonging to different domains.

These techniques can be particularly useful to manage two key services in Grid information systems: *membership management* (or simply *membership*) and *resource discovery*. The objective of a membership management service is twofold: adding a new node to the network, and assigning this node a set of neighbor nodes. The resource discovery service is invoked by a node when it needs to discover and use hardware or software resources having given characteristics.

In currently deployed Grid systems, resources are often owned by research centers, public institutions, or large enterprises: in such organizations hosts and resources are usually stable. Hence, membership management and resource discovery services are efficiently handled through centralized or hierarchical approaches, as in the OGSA and WSRF frameworks. As opposed to Grids, in Peer network systems nodes and resources provided to the community are very dynamic: peers can be frequently switched off or disconnected. In such an environment a distributed approach is more effective and fault-tolerant than a centralized or hierarchical one.

Deterministic-peer networks have been proposed [13] to achieve a balance between the inherent efficiency of centralized search, and the autonomy, load balancing and fault tolerant features offered by distributed search. A deterministic node acts as a centralized resource for a number of regular peers, while super-peers connect to each other to form a network that exploits peer mechanisms at a higher level.

Here Grid model allows for a very efficient implementation of the information service and it is naturally appropriate for large-scale Grids. A Grid can be viewed as a network composed of small-scale, proprietary Grids, called Virtual Organizations (VOs). Within each VO, one or more nodes, e.g. those that have the largest capabilities. With the rapid development of Peer-to-Peer systems, Peer Data Management System (PDMS) has become a promising area.

A P2P system consists of a large number of nodes that can exchange data and services in a decentralized and distributed manner. Peers are autonomous, dynamic and heterogeneous. The original motivation for most early network systems was file sharing. In peered systems, resources are distributed at multiple autonomous sites. Each site has equal functionality and can play roles of both client and server. Usually, a Peer system has the characteristics of local control of data, dynamic addition and removal of peers, local knowledge of available data and schemas, self-organization and self-optimization.

Current peered systems are of three kinds:
(1) the unstructured Peered systems such as Gnutella, where peers may join and leave the network without any notification and may connect to whomever they wish; (2) the structured peered systems, where peers are organized into a rigid structure and connections between peers are fixed according to a certain protocol and data placement is related to the structure formed by peer connections; and (3) the hybrid Peered systems, where file sharing is decentralized, but the file directory is centralized. The unstructured Peered systems enable complex queries. However, they provide no search guarantees and are not suitable for large-scale Peered networks. The structured Peered systems guarantee to find matching answers if the answers exist in the network; however, they cannot support complex queries. The hybrid Peered systems use servers for storing file directories and have limited scalability.

II. Related work

Many efforts have been devoted to develop semantic overlay networks to organize and manage semi-structured and structured data in large-scale, decentralized, heterogeneous and dynamic environments (Aberer and Cudre- Mauroux, 2005).

According to the topology of the underlying P2P networks, the Peer Data Management Systems (PDMS) can be unstructured and structured. Previous research on unstructured PDMS mainly concerns:

(1) Resource Management – including a local relational model for mediating peers in PDMS (Bernsteinet al., 2002), an architecture for supporting data coordination between peer databases (Giunchiglia and Zaihrayeu, 2002), the semantic overlay clustering approaches for peer organization (Nejdl et al., 2003), and P2P-based systems for distributed data sharing and management (Ng et al., 2003).

(2) Query Routing – including semantic-based content search approach in P2P networks (Shen et al., 2004), and the structure index over XML documents by using multi-level Breadth and Depth Bloom filters(Koloniari et al., 2003).

(3) Query Reformulation – including semantic and algorithmic issues of mapping data in P2P systems (Hellerstein, 2004; Kementsietsidis et al., 2003), algorithms for query reformulation and data integration between peers (Lenzerini, 2004; Tatarinov and Halevy, 2004), and the Piazza system for mediating between data sources on the Semantic Web (Halevyet al., 2003). Some structured PDMS have been developed, such as:

(A) The PIER system, for accessing data via DHTs or via an extensible iterate or wrapper that produces a stream of structured data from a local data source (Huebsch et al., 2005).

(B) The Squid system, for peer-to-peer information discovery through a dimension-reducing indexing schema, the Hilbert Space-Filling-Curves (SFCs) that can effectively map multidimensional information space to physical peers (Schmidt and Parashar, 2004).

(C) The AmbientDB prototype, developed at CWI, for providing full relational database functionality in ad-hoc P2P networks (Boncz and Treijtel, 2003).

(D) The IMAGINE-P2P platform, for supporting indexbased path queries by incorporating the semantic overlay with the underlying structured P2P networks (Zhuge et al., 2005b).

(E) The distributed RDF repository RDFPeers,for storing each triple (Subject, Predicate,Object) of RDFdocuments at three places in a multi attribute addressable network by applyin globally known hash functions (Cai and Frank ,2004) General architecture As shown in Fig. 1, the basic R-Chord model consists of the RSM or the SLN above the unstructured or structured P2P networks, while the extended model is the combination of the RSM, the SLN and the P2P networks.

Fig. 1 illustrates the overlays of the R-Chord: (1) the top layer is the Resource Space Model (RSM) and the Peer-to-Peer Semantic Link Network (P2PSLN); (2) the middle layer is the structured P2P network, that is the Chord overlay; and (3) the bottom layer is the underlying P2P network including various data files and services at each peer. Each resource space is stored at a super peer, the peer relatively stable and with good processing capabilities for organizing and managing ordinary peers. When a peer P_i joins a P2P network, it will register at one of the super peers according to the category of data in P_i. In the following, the RSM and the super peer share the same meaning. The Resource Space Model, denoted as $RS(X_1,X_2, .. . ,X_n)$ or RS in simple, specifies, organizes and manages resources with a universal view by using n-dimensional spaces where every point uniquely determines one resource or a set of inter-related resources (Zhuge, 2004a).

Below layered image specify hoe all the layers are working together with integration of required network specific architecture of peered control grid network so that user can have access to the services avail for all the required on demand routing packages; here we can find the I node as an address holder for any addressing protocol and the remaining nodes are specifying the next node address. All the coordinates represent the position of address in the form of $(x_{1,} x_2, x3 \ldots\ldots\ldots.. x_i)$ similarly we can have axis co-ordinate for semantic network layer to specify the actual address fault isolation

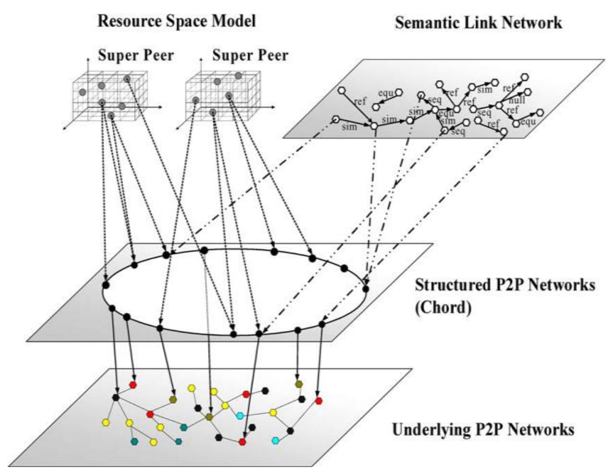

Fig1 Illustration of chord overlay on P2P Networks

Herein, RS is the name of the resource space and X_i is the name of an axis. jRSj is the number of dimensions of the resource space, $X_i = \{C_{i1},C_{i2}, . . . ,C_{im}\}$ represents axis X_i with its coordinates, and C_{ij} denotes the coordinate name. Resources in RSM can be uniquely determined by a set of given coordinates. Each point in an RSM can be a resource set, a sub resource space or a P2P semantic link network.

III. Proposed algorithm and addressing scheme

In this paper we consider a Bit Torrent-like system with two classes of peers, with the classes denoted by i = 1 and i = 2. All the peers in both classes want to obtain the single _le F. Without loss of generality, we take the _le size to be equal to. It will be proceed as below

1. Each class has seeds and downloader's (leechers). Seeds have all of the _le, whereas downloader's have only portions of the _le. When a downloader obtains the whole _le, it immediately becomes a seed. Let yi(t) and xi(t) denote the number of seeds and downloader's, respectively, for class-i peers at time t. In this paper, we are particularly interested in the steady-state behavior of yi and xi, i = 1; 2. We need to also de_ne the following: _ Let _i be the rate at which new class-i downloader arrive. Whenever a new class-downloader

arrives, then xi is incremented by 1_ Let _i be the upload bandwidth of a peer from class i. _ Let ci be the download bandwidth of appear from class i. We make the realistic assumption that ci _ _i, which is consistent with the contemporary access technologies. Whenever a class-i peer has fully downloaded the _le, xi is decremented by 1 and yi is incremented by 1._ As in [7], we allow downloader to abort downloading before fully obtaining the _le. Let _i be the rate at which class-i downloader abort. Whenever a class-i downloader aborts, xi is decremented by Li.

In this paper we limit our attention to static allocation policies, namely, policies of the form $\_{i}$(x_1; x_2) = $\_{i}$ for all x_1 and x_2 for i = 1; 2. We will consider dynamic policies in a future work. Our model of the two-class multiclass P2P network is now complete. Below code summarizes the states and rates in the system.

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IV Proposed Model for distributed address delivery services

According to the relationship between resource spaces being indexed, three types of RSM view are defined:

- Join View – the view formed by the Join operation on the resource spaces being indexed, denoted as RS1 •join view RS2.
- Merge View – the view formed by the Merge operation on the resource spaces being indexed, denoted as RS1 •merge view RS2.
- Union View – the view formed by the Union operation on the resource spaces being indexed, denoted as RS1 •union view RS2. According to the normal form theory of RSM (Zhuge, 2004a), we have the following lemmas: Lemma 1. Let RS1 •join view RS2) RSJoinView

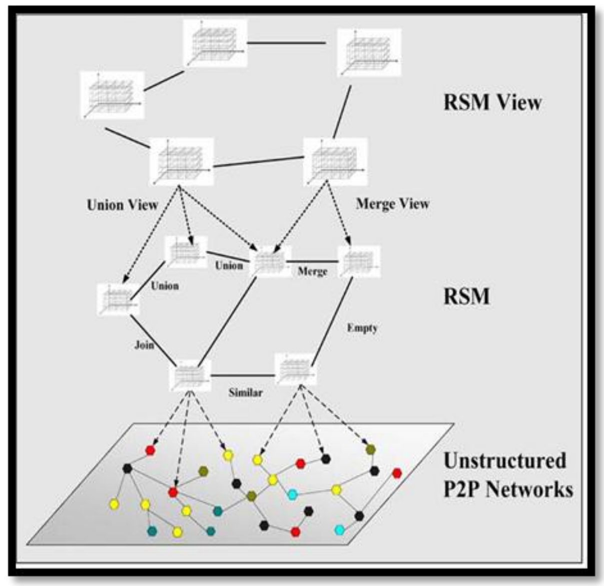

Fig 2: Unstructured Peered Network View

Similarly we can also have the structured scenario to work in the same network environment we have the analyticle diagram for structured network for this purpose we need to analyse union view , merge view and empty view like as following

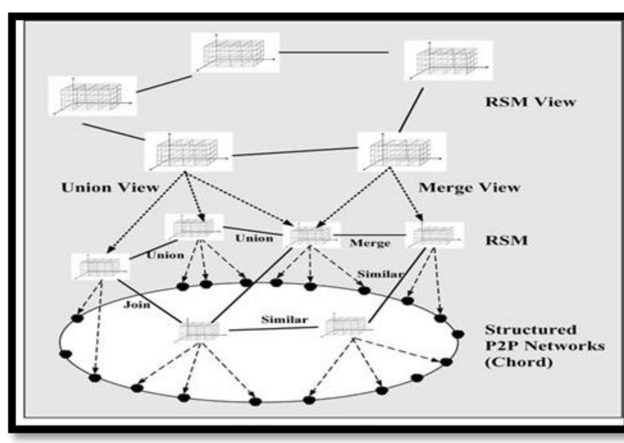

Fig 3: Structured Peered Network View

V. Performance analysis

Fig. 4.1 plots the number of data nodes involved in the unstructured and structured approaches. The data nodes are the nodes that store data items satisfying a query, while the involved nodes are the nodes being visited to locate the required data nodes according to the Chord protocol. On average, the number of data nodes visited by the R-Chord and Chord approaches is 194 and 835. The optimum number of data nodes involved in Unstructured Peered is 89. Fig.4.1shows that for answering a query, almost all the data nodes in the Peered networks are involved in Chord And R- Chord, while only 23.23% of all the data nodes are involved in proposed model. Fig. 4.2 plots the visiting times on data nodes in R-Chord and Chord approaches. On average, the visiting times on the data nodes are 884 and 1835, respectively. On average, the visiting times on the data nodes in proposed are 97. Fig. 4.2 shows that for answering a query, the visiting times on data nodes in R-Chord approach are about 48.17% of the visiting times in Chord approach. Fig. 4.2 plots the total visiting times of nodes involved for answering each query. On average, the total visiting times of nodes involved in R-Chord and Chord approaches are 21,277 and 75,102 While total visiting times of nodes involved in EOOP is 2,105. By comparing Fig. 4.1 with Fig. 4.2 , the following conclusions can be drawn:

(1) The visiting times of DAD data nodes are quite less than the total involved times of all the nodes.

(2) To answer a query, the total involved times of nodes in the R-Chord approach are only about 28.33% of that of the Chord approach while in DAD is 12.23%. This is because the R-Chord approach uses the classification attribute (Journal, Year) to organize and retrieve data, which can reduce the search times exponentially, while on average the latter requires O(logN) steps to locate each required data item.

SFCs support complex queries such as partial keywords, wildcards and ranges in P2P networks. The differences between the R-Chord and SFC-based routing approaches are in three aspects:

1. Number of the Coordinates – Both the SFC and the R-Chord approaches organizes resources in d-dimensional spaces; however, the SFC approach requires that the number of coordinates on each axis is the same, while the RSM approach does not have that limitation so it is more flexible for resource organization.

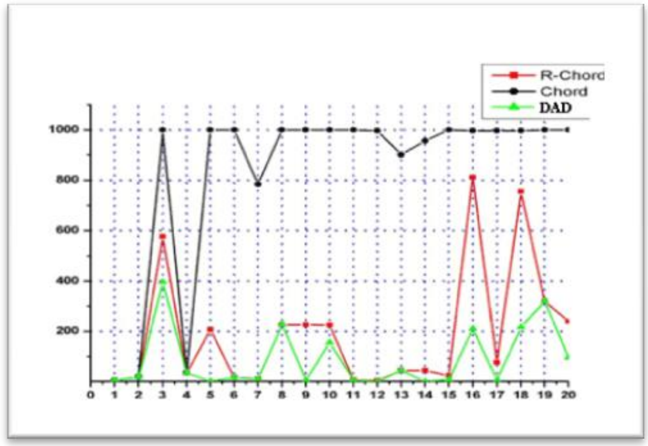

Fig4.1 Number of data node involved in DAD and chord approach

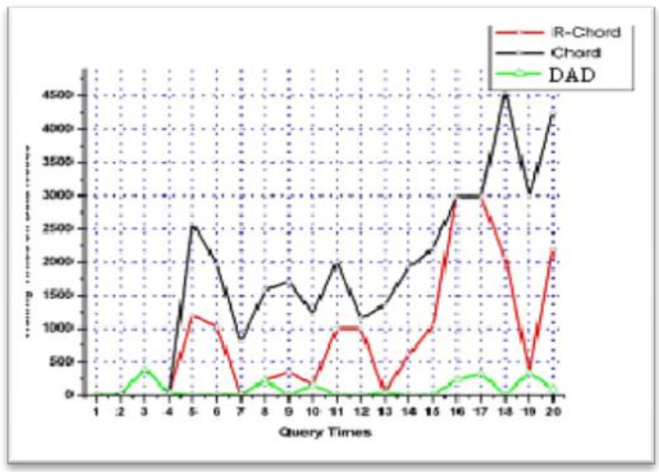

Fig4.2 Visiting times of data nodes in DAD & chord approach

2. Integrity Constraint – The SFC-based approach does not consider integrity constraints, while the normal forms of RSM provide designers with guidelines for guaranteeing

3. Multiple Spaces vs. One Space – Only one d-dimensional space is involved in the SFC-based approach, while in R-Chord approach, semantic links between resource spaces are established to denote the semantic relationship between multiple resource spaces for query routing.

As the comparative analysis says that how R chord and DAD performing the node addressing on time ti per activity they are showring how to making inractive in whole active session and make each bit of interfarance.

VI. Conclusion

This paper proposed DAD Model with R-Chord, a new semantic-based peer data management deterministic model (fig:3), by incorporating the Resource Space Model, the P2P Semantic Link Network Model and the DHT Chord protocol. It incorporates the advantages of the structured and unstructured P2P networks. The Chord protocol ensures the efficiency of query routing in large-scale P2P networks, while the RSM and the P2PSLN routing strategies incorporate the classification semantics and the relational semantics. Combination of these models forms an efficient solution for P2P resource management. The efficiency of R-Chord, Chord and DAD is measured by three criteria (ref. fig: 4.2):

- The number of data nodes involved for answering queries;
- The visiting times on data nodes;
- The visiting times on all the involved nodes.

The DAD approach provides a scalable semantic overlay for managing distributed resources in the Knowledge Grid (Zhuge, 2004b).Ongoing work includes two aspects:

1. Supporting advanced relational operations, such as join, top-K ranking, in Peer to Peer networks;

2. Incorporating query optimization techniques into DAD model to improve its effectiveness and efficiency

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